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It is highly unlikely that the development of an abdominal wall hernia can be attributable to a single strenuous event

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ABSTRACT

INTRODUCTION There is a commonly held belief that the development of a hernia can be attributed to a single strenuous or traumatic event. Hence, many litigants are successful in compensation claims, causing mounting financial burdens on employers, the courts, insurance companies and the tax-payer. However, there is very little scientific evidence to support this assertion. The aim of this study was to ascertain whether there was any causal link in this process.

PATIENTS AND METHODS A total of 133 new patients with 135 abdominal herniae of all varieties (115 inguinal, 3 femoral, 9 umbilical, 4 incisional, and 4 ventral or epigastric), of which 25 were recurrent received structured questionnaires on arrival in the surgical clinic. These questionnaires covered all possible aetiological factors for hernia development (type of work, COAD, smoking, pregnancy, obesity, chronic bladder outflow obstruction, previous surgery including appendicectomy), in addition to any possible attribution to a single strenuous or traumatic event. We then reviewed the GP records in the surgery of all patients who answered positively to the latter possible cause.

RESULTS In the study group, 119 (89%) reported a gradual onset of symptoms. Of the 15 (12 male, 3 female; 11%) who believed that their hernia might be related to a single strenuous or traumatic event, 5 had no other aetiological factors. However, not one of the 15 was found to have contemporaneous forensic medical evidence to support their possible claim.

CONCLUSIONS We conclude that we are unable to find any clinical evidence to support the hypothesis that a hernia might develop as the result of one single strenuous or traumatic event. While we accept that this mechanism might still possibly occur, we believe that, at best, it is extremely uncommon. If a medical expert is preparing a report on such a case in a claim for personal injury, then they have a duty to the court to examine carefully all the contemporaneous medical records. If no clinical evidence exists to support the claim, then they have a duty to the court not to support the plaintiff's claim.

KEYWORDS
Hernia – Strenuous event – Traumatic event – Litigation

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The incidence of inguinal hernia in the population varies between 2% and 4%, increasing with age up to 20% and is slightly higher in males.[1,2] In up to 15% of patients, they occur bilaterally. Whereas most inguinal herniae occur in males, 75% of all femoral herniae occur in females. Femoral and umbilical herniae (and herniae in rarer locations) constitute around 5–10% of all herniae.[1] Incisional herniae constitute around 10% of all herniae.[1] Generally, herniae are thought to be related to structural abnormalities in the musculature of the abdominal wall. Historically, precipitating factors for herniae have included obesity, chronic obstructive lung disease, prostatism, smoking and advancing age,[3] although there are little robust scientific data to support these assertions.

There is a belief that hernia can be caused by a single strenuous event,[4] although others contend that there is little evidence to suggest that such an event (*e.g.* lifting a heavy object or a fall) can directly lead to the development of a hernia.[5] There are reports that suggest that repetitive strain affecting heavy manual labourers may contribute to subsequent hernia development.[6–9] However, others hold equally strong opinions that there are no detectable relationships between the nature of an employee's work and the development of an abdominal wall hernia.[10–15]

In the current medicolegal climate, many people are led to believe (probably by aggressive advertising by some members of the legal profession) that their injury is in fact due to the negligence of either their employer or another body.[4] One of the commoner claims encountered for personal injury by expert witnesses in general surgery involves employees suing their employer following the development of an inguinal hernia, after being asked to undertake what is regarded (by the worker) as an unreasonable request.[4,6–9] The senior author has prepared reports on 11 such cases over the preceding 12 months, and a total of over 50 during the last 7 years. The senior author has relied on the conclusions of Smith *et al*.[4] when considering issues of causation in hernia arising after incidents involving a single strenuous event, which may have been the responsibility of another party.

Such claims are both time-consuming and costly, both to the courts (and, therefore, the tax payer) and the insurance companies (so adding to the ever increasing burden of insurance premiums), as well as causing severe financial cost to the employer.

Only one previous study has attempted objectively and prospectively to assess the relationship between the development of a hernia and a single strenuous event.[4] This study specifically examined the possible causal role of a single traumatic event in the development of inguinal hernia, and concluded that there was a possible association in 7% of cases. These authors examined a consecutive series of 129 patients, with a total of 145 inguinal herniae, and concluded that if there was:

1. *An officially reported incident of muscle strain.*
2. *Documented severe groin pain at the time of the strain.*
3. *Diagnosis of an inguinal hernia by a doctor, preferably within 3 days of the muscle strain, and certainly within 30 days.*
4. *No previous history of an inguinal hernia.*

Then it would be reasonable to conclude that the court might accept a causal link between the single strenuous event and the development of the hernia.

The aim of this study was to survey prospectively a consecutive series of adult patients of employable age (16–65 years) presenting to a general surgical clinic with all types of abdominal wall herniae. The intention was to reproduce the methodology of Smith *et al*.[4] and ascertain whether or not their conclusions could be supported in the setting of our own surgical clinic.

Patients and Methods

Following the granting of local ethical approval and signed informed consent from all participating patients, questionnaires were issued to a consecutive cohort of new patients presenting with an abdominal wall hernia. Data were collected from a single cohort study of patients presenting to a general surgical clinic at an urban general hospital over a 6-month period (January 2003 to June 2003). The sample size was chosen to reflect the population examined in the previous study.[4]

The questionnaire recorded details of all possible aetiological factors in hernia development, including possible causal link to a single strenuous or traumatic event. These details were laid out in a random manner with the intention of not giving the patient any obvious clues about the aetiology of the hernia (thereby reducing error due to suggestion). The possible aetiological factors included: type of work and labour history; chronic obstructive airways disease; smoking; pregnancy; obesity; chronic bladder outflow obstruction; and previous surgery including appendicectomy. We also enquired as to whether or not there was a family history of hernia.

If the patient thought that there was a possible causal link between an episode of trauma and the finding of the hernia, then they were invited to give details of the history of the injury. All the patients gave informed consent to the researchers then being allowed to study their contemporaneous general practitioner and work-related occupational health (if relevant) records. Any history of previous hernia repair was also documented.

Results

One patient declined to enter the study. The remaining 133 patients with a total of 135 herniae did enter the study of whom 104 (84%) were men. Of these 135 herniae, 115 were inguinal (113 unilateral, 2 bilateral), 3 femoral, 9 umbilical or paraumbilical, 4 incisional, and 4 epigastric or ventral. Twenty-five of the herniae were recurrent. Of the patients, 24% were either smokers or ex-smokers and 24% of the patients had a close relative who also suffered from a hernia.

In 119 (89%) cases, the hernia had been gradual or insidious in onset. There was a convincing history correlating the onset of hernia symptoms to a single strenuous event in 14 patients (11 male, 3 female: 11 inguinal, 2 recurrent inguinal and 1 incisional hernia) suggestive of an association between a particular muscle strain, groin pain and the development of a groin hernia. Two of these patients had had a previous hernia (therefore, according to the criteria laid down by Smith *et al*.,[4] these were negative cases) and one had an appendicectomy possibly predisposing him to the development of his right inguinal hernia.[11] Only 5 patients had absolutely no risk factors (familial link, smoker, previous abdominal surgery, and for women the number of children and types of delivery). Only one of these 14 patients stated that they had a strenuous job which involved repetitive heavy lifting or straining. Three patients stated that they believed that their herniae had developed due to strenuous

exercise and stretching. Two patients claimed that coughing precipitated their hernia, and two said that their hernia came on suddenly but could not recall what they were doing at the time. The remainder believed that the aetiology of their herniae was related to a strenuous event but were unable to identify specifically the causal act. None of these 6 undertook a job that included strenuous physical labouring.

Careful review of the general practitioner and/or occupational health records of those patients who linked the onset of their hernia to a single strenuous event was unable to identify any patient who met the criteria as stated by Smith *et al*.[4] The median time between the putative strenuous event and presentation to the GP was 6 weeks (range, 5–13 weeks); therefore, according to these criteria, no patient developed a hernia secondary to a single strenuous event. Therefore, none of our study patients would have had a strong case for compensation that could be supported in a court of law.

Discussion

At present, the evidence linking heavy manual jobs, and in particular single strenuous events to the development of a hernia is contradictory. Although the evidence is currently inconclusive, some litigants are successful in claiming compensation, even though some expert's state: 'strenuous physical activity by itself does not cause primary or recurrent inguinal herniation'.[13] Only one patient of the 14 identified as possibly having a causal link in our study admitted to a physically strenuous job. In his case, we were unable to identify any contemporaneous medical evidence to support his assertion. We accept that the courts may support a possible causal link between the development of a hernia and repeated strenuous exertion at work (akin to repetitive strain injury).[6,7,11]

Unlike previous studies, which looked at causal mechanisms of inguinal hernia,[4,5,8,12–14] our study addressed the possibility of a causal link between a single strenuous event and the development of all common forms of abdominal wall hernia. However, our results seem to bear out that the same very limited, or possibly non-existing relationship reported in these earlier studies, relates to other forms of hernia. We accept that the present study consists of a variety of abdominal wall herniae (ventral and groin, primary and recurrent) and the aetiology of groin herniae may differ from that of ventral herniae.[5] Furthermore, patients who have undergone previous surgery with an adverse result (recurrent herniae and incisional herniae) may also represent another aetiology and or pathogenesis.[5] However, in the eyes of the law, and in particular those of the plaintiff, such subtleties are not obviously apparent. Therefore, we think that it is appropriate in a study of this type to consider all abdominal wall herniae as a group.

The only previous prospective investigation into this subject[4] identified a possible 7% correlation between a single muscular strain and the development of an inguinal hernia. In this study, one-third of the patients had an indirect sac, which indicates that they were possibly already predisposed to developing a hernia. The actual correlation rate was probably even lower, as the other patients may also have had an inherent weakness in their musculature, which probably contributed to the development of the hernia.[4] These authors concluded that their study confirmed that there was seldom any subjective association between a muscle strain and the onset of a groin hernia.

Our study identified a similar proportion of patients who claimed to have an association between a muscular strain and the development of their hernia. As with the previous study, we reviewed the contemporaneous past medical records to attempt to verify the patients" statements.[4] Using the criteria of these authors, we were unable to identify any patient who could (if they so wished) make a legitimate claim for compensation. We found the GP notes to be very brief, merely stating the diagnosis and making a note of the hospital referral; this observation does raise the possibility that the GP may have overlooked the subtlety of examination (or even history) required to make such a link to the diagnosis. We are left with three possible conclusions:

1. *The claimants did actually have a traumatic hernia and it was not properly documented.*
2. *The GP did not notice anything suggestive of a traumatic hernia (soft tissue injury, bruising or a haematoma) and so did not document it.*
3. *There is no causal link between the development of an abdominal wall hernia and a single strenuous event.*

Clearly, one factor that may influence this difference is that a history of injury is not always recorded in the hospital or GP notes, possibly because it is not considered clinically important or relevant.[5] Where an incident is related in the accident book at work, it is essential in medicolegal cases to review the pre-existing medical records to exclude a prior diagnosis of hernia.[5]

We accept that we may have missed genuine cases, with documented supporting contemporaneous evidence of a causal link between a strenuous event and the subsequent rapid onset of a hernia. We also accept that it is sometimes difficult to obtain an urgent appointment to see a GP, and patients may wait well in excess of 14 days for their appointment. However, we think that it is unlikely that this factor would have been true for all 14 patients.

Conclusions

Such causal links (if they exist) are extremely uncommon. Therefore, it is essential that, before a medicolegal expert

provides a report supporting a claimant in such a case, there is a very rigorous examination of all the contemporaneous medical records. Such a report should only be accepted by the court if it is supported by a clear forensic examination of the clinical records. Therefore, we believe that there is very little evidence to support the hypothesis that there might be a causal link between the development of any abdominal wall hernia and a single strenuous event.

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